CLAIMS

1. A process making it possible to counter the vibrations induced, in an aircraft (1) equipped with engines (5 to 8) of the turbofan type, by the windmilling of at least one of the fans of said engines, said aircraft comprising a system of electric flight controls (17) which:

- produces electric flight control commands (dZ, dY) intended for servocontrols (25A, 25B, 26A, 26B) able to actuate the control surfaces of said aircraft; and
- slaves said servocontrols to said electric flight control commands, limiting the operation of said servocontrols in a reduced frequency band,

wherein:

- the appearance of said induced vibrations is monitored; and
- in case of detection of such induced vibrations:
  - an additional electric control command (δZ, δY) is computed, which, applied to the servocontrol of at least one control surface, allows the latter to oppose said induced vibrations;
  - the electric flight control command (dZ, dY) relating to said control surface and said additional electric control command (δZ, δY) are summed to obtain an overall control command for said control surface; and
  - said servocontrol is temporarily slaved to said overall control command, allowing the operation of said servocontrol in a widened frequency band.

2. The process as claimed in claim 1, wherein, to detect said induced vibrations, accelerometric measurements are performed at at least one point (29 to 32) of said aircraft and the amplitude

of the accelerometric measurements, whose frequency lies between 5Hz and 15Hz, is compared to a predetermined threshold representative of said induced vibrations.

3. The process as claimed in claim 2, wherein said accelerometric measurements intended for the detection of said induced vibrations are performed in the neighborhood of said engines.

4. A process as claimed in claim 1, wherein, to compute said additional electric control command, accelerometric measurements representative of said induced vibrations are performed at at least one location (34.1 to 34.n) of said aircraft, and said additional electric control command is determined on the basis of preestablished relations which, for each acceleration at said location, are able to deliver one such additional electric control command.

5. The process as claimed in claim 4, wherein said accelerometric measurements intended for the computation of said additional electric control command are performed in the fuselage and, more particularly, on the flight deck of said aircraft.

6. The process as claimed in claim 4, for an aircraft comprising at least two pairs of symmetric control surfaces (21A, 21B - 22A, 22B), steered by a vertical electric flight control command and by a lateral electric flight control command, wherein:

- a first additional electric control command (δZ) able to counter the vertical component of said induced vibrations at said location is computed;
- a second additional electric control command (δY) able to counter the lateral component of said induced vibrations at said location is computed;

- said vertical electric flight control command (dZ) and said first additional electric control command (δZ) are summed to obtain a first overall control command;
- said lateral flight control command (dY) and said second additional electric control command (δY) are summed to obtain a second overall control command;
- the servocontrols of the two symmetric control surfaces (21A, 21B) of one of said pairs are slaved to said first overall control command, in common, in such a way that these control surfaces deflect symmetrically in the same direction; and
- the servocontrols of the two symmetric control surfaces (22A, 22B) of the other of said pairs are slaved to said second overall control command, in common, in such a way that these latter control surfaces deflect antisymmetrically in opposite directions.

7. A system of electric flight controls for an aircraft, which is equipped with engines of the turbofan type, each comprising a fan able to windmill in case of shutdown of said engine in flight, said system producing, for the control surfaces of said aircraft, electric control commands (dZ, dY) which are addressed to respective servocontrols (25A, 25B, 26A, 26B) able to actuate said control surfaces by way of slaving means (27A, 28A) limiting the operation of said servocontrols in a reduced frequency band,
which system comprises:

- means (29 to 33) of detection of the appearance of the vibrations induced in the aircraft by the windmilling of at least one of said fans;
- means (34.1 to 34.n) of measurement of said induced vibrations at at least one location of said aircraft;

- at least one table (35B) in which are recorded preestablished relations between the vibrations induced at said location and the order that must be addressed to at least one control surface to counter said induced vibrations;
- means of computation (35A), connected to said means of measurement and to said table, to produce an additional electric control command which, applied to at least said control surface, is able to counter said vibrations induced at least at said location of said aircraft;
- means of summation (36, 39) making it possible to combine, into an overall control command for said control surface, said electric control command which relates thereto and said additional electric control command; and
- means (27B, 28B) for temporarily slaving said servocontrol to said overall command, allowing the operation of said servocontrol in a widened frequency band.

8. The system as claimed in claim 7, wherein said means of detection comprise accelerometers (29 to 32) disposed in the neighborhood of at least some of said engines.

9. The system as claimed in claim 7, wherein said means of measurement comprise accelerometers (34.1 to 34.n) disposed in the fuselage and, more particularly, on the flight deck of said aircraft.

10. The system as claimed in claim 7, wherein:

- the means of slaving to a reduced frequency band and the means of temporary slaving to a widened frequency band consist of two distinct slaving devices; and

- means of switching (38, 41) are provided for, when said means of detection detect the appearance of said induced vibrations:
  - disabling the device of slaving (27A, 28A) to a reduced frequency band; and
  - enabling said device for temporary slaving (27B, 28B) to a widened frequency band in such a way that the servocontrol associated with said control surface can be governed by said overall control command.

11. The system as claimed in claim 7, wherein said means of slaving to a reduced frequency band and means of temporary slaving to a widened frequency band consist, at least in part, of the same hardware items, at least some of which are adjustable so as to allow said frequency band to be varied.

12. The system as claimed in claim 7, wherein said means of computation (35A) are enabled by said means of detection (33) upon the appearance of said induced vibrations.

13. The system as claimed in claim 7, for an aircraft (1) which comprises at least two pairs of symmetric control surfaces (21A, 21B - 22A, 22B), said system of controls (17) producing for said control surfaces a vertical electric flight control command (dZ) and a lateral electric flight control command (dY):
wherein:

- said means of measurement (34.1 to 34.n) deliver the vertical component and the lateral component of said induced vibrations;
- said means of computation (35A) compute a first and a second additional electric control command (δZ, δY) able respectively to counter said vertical and lateral components of said induced vibrations;

- said means of summation add together:
  - said vertical electric flight control command and said first additional electric control command to form a first overall control command;
  - said lateral electric flight control command and said second additional control command to form a second overall control command; and
- said means of temporary slaving (27B) slave, to said first overall control command, the servocontrols (25A, 25B) of the two symmetric control surfaces (21A, 21B) of one of said pairs in such a way that these latter control surfaces deflect symmetrically in the same direction; and
- said means of temporary slaving (28B) slave, to said second overall control command, the servocontrols (26A, 26B) of the two symmetric control surfaces (22A, 22B) of the other of said pairs in such a way that these latter control surfaces deflect antisymmetrically in opposite directions.

14. The system as claimed in claim 7, wherein said means of computation (35A) form an integral part of said system of electric flight controls (17).